

Bench Tests of Two-Stroke Opposed Piston Aircraft Diesel Engine under Propeller Characteristics Conditions

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Abstract : Due to the growing popularity of light aircraft, it has become necessary to develop aircraft engines for this type of construction. One of engine system, designed to increase efficiency and reduce weight, is the engine with opposed pistons. In such an engine, the combustion chamber is formed by two pistons moving in one cylinder. Therefore, this type of engines run in a two-stroke cycle, so they have many advantages such as high power and torque, high efficiency, or a favorable power-to-weight ratio. Tests of one of the available aircraft engines with opposing piston system fueled with diesel oil were carried out on an engine dynamometer equipped with an eddy current brake and the necessary measuring and testing equipment. In order to get to know the basic parameters of the engine, the tests were carried out under partial load conditions for the following torque values: 40, 60, 80, 100 Nm. The rotational speed was changed from 1600 to 2500 rpm. Measurements were also taken for designated points of propeller characteristics. During the tests, the engine torque, engine power, fuel consumption, intake manifold pressure, and oil pressure were recorded. On the basis of the measurements carried out for particular loads, the power curve, hourly and specific fuel consumption curves were determined. Characteristics of charge pressure as a function of rotational speed as well as power, torque, hourly and specific fuel consumption curves for propeller characteristics were also prepared. The obtained characteristics make it possible to select the optimal points of engine operation.

Keywords : aircraft, diesel, engine testing, opposed piston

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